

## **REMOTE SENSING AND BROWN MARSH**

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Use of remote sensing for locating and monitoring of brown marsh can be achieved through a number of means. Aerial surveys by Greg Linscombe and Robert Chabreck along with Tommy Michot and others have been key in locating and determining the extent of brown marsh. Aerial photography is important to provide high-resolution imagery for studying wetland areas. Satellite imagery has been used for determining the utility of this data source for wide area monitoring of large areas of wetlands across different salinity regimes.

Remote sensing is particularly good in its use and timeliness for state and federal agencies and local parishes. However, it is not expected that remotely sensed data can, nor should replace high-resolution aerial survey efforts. Used as a monitoring tool, remotely sensed data collected and analyzed on a regular basis will serve to maximize the state's effectiveness in these efforts by utilizing the coarser scaled, more affordable remotely sensed data to identify precisely where more expensive, more labor intensive, yet much higher resolution aerial surveys should be employed. When used together in a coordinated effort both types of imagery will be used to provide the state with better data at a lower cost in a more timely fashion to track, study, and restore or remediate coastal marshes. Looking at the remote sensing in a coordinated fashion can give scientists an important tool for day to day efforts in local study areas and also can give the state the option to expand monitoring efforts to a more comprehensive state-wide coverage of the coast to monitor the brown marsh problem for all of coastal Louisiana.

For satellite imagery, LANDSAT7 and SPOT imagery has been acquired and processed and raw imagery has been shared with all those interested in receiving the data. Both data sources are easy to acquire and have been used by many agencies and groups in the state in the past. Indeed, National Oceanic and Atmospheric Administration's (NOAA) sponsorship of using satellite imagery is to test the utility of two conventional sources of imagery that could be processed with fairly standard means and be fairly consistent in matching up to the imagery acquired by aerial surveys and also ground truthed locally working with groups in the field such as the Louisiana Department of Natural Resources (LDNR), USGS National Wetlands Research Center (NWRC) and others. Overall the following is found:

-LANDSAT7 and SPOT can identify, locate, and monitor existing brown marsh areas on a large area basis and can track changes in areas of sizes in the 30 m diameter and larger category,

-Both image sources can be acquired on a monthly basis and used locally for monitoring changes in brown marsh areas across both the salt and brackish marshes and for the eastern and western side of the state.

-Processing of imagery can be done locally with a collaboration of university and contractor support working with state and federal agencies and can serve as a means for using raw imagery for special work and also processing all the imagery using conventional techniques and providing it to users via the Internet,

-Keeping local interaction and processing of imagery in working with state and federal agencies can provide some important information for monitoring and remediation and restoration planning and implementation. Tracking of brown marsh areas for recovery, conversion to open water or some interim transition can also be readily in a format that can be imported and used on any GIS system that the state or federal agencies or local parishes are using today.

Monitoring brown marsh areas for the next 2-3 years on a frequent basis and for the coast starting in the east but hopefully expanding it to the full state coastline should provide a good means, working with field and aerial surveys, to provide the best set of data sources for the state to assess and respond to brown marsh in the near term for the next few years.

Overall, NOAA proposes working with LDNR, Louisiana Department of Wildlife and Fisheries, the Governor's Office, NWRC, Barataria-Terrebonne National Estuary Program (BTNEP), other state and federal agencies and local parishes, and a number of universities to help acquire, process, and distribute raw and processed imagery in formats and of areas of concern for work in the monitoring of brown marsh. The goal of providing imagery that is very current and can be processed in a few days and made available for local use is very workable. Using an interagency group of state and federal and university representatives to provide the coordination on the frequency of obtaining imagery and the processing and distribution is the key to making this useful as possible.